Enhancement of Watershed Protection Measures in the Karst Region of Pleasant Grove Creek (KY)

EPA Region 4 - Atlanta

Geographic location or area of activity: Pleasant Grove Creek in the lower section of the Red River Watershed situated in the Mississippian Plateau, known as Pennyroyal Plain, in southwestern Kentucky and northwestern Tennessee

Description of activity: About 2.4 miles from its confluence with the upper Red River, Pleasant Grove Creek resurfaces out of a karst aquifer spring, the discharge point for underground karst aquifers. These differ from normal granular aquifers because water in karst aquifers moves quickly through large conduits (caves) much like a sewer system, receiving little filtration. The close interaction between ground and surface water in the basin complicates water monitoring and the selection and implementation of best management practices (BMPs), and impedes the process of understanding watershed pollutants.

Currently, the Pleasant Grove Creek does not meet EPA's or the Commonwealth of Kentucky's State water quality standards and has been identified as an impaired waterbody on the 303(d) list since 2002. The Red River watershed, which includes Pleasant Grove Creek, is both a regional and a national priority watershed. Because of degraded water quality, the Logan County Water District is forced to purchase water from Guthrie, Kentucky, which has its source water pumped from the Cumberland River in Clarksville, Tennessee. The stream has many water quality challenges because it is surrounded by agriculture, is situated in an area of major karst terrain, and receives frequent loading nutrients. This project will demonstrate approaches for pollution prevention, sustainable agriculture practices, decreased nutrient loading, and enhanced riparian habitat protection; enhance community outreach and education concerning water quality and pollution control; and result in a credible restoration plan to complement on-going national and regional efforts in the Red River Watershed.

The project goal is to restore water quality throughout Pleasant Grove Creek by implementing riparian and sinkhole protection BMPs. The ultimate goal is to improve groundwater quality by improving the nutrient-filtering capacity of sinkholes. Project objectives include the following:

- Create two community education centers
- Develop a comprehensive GIS dataset for the upper watershed
- Hold workshop meetings for KY & TN agencies to review BMP alternatives
- Conduct demonstration projects, provide preliminary evaluation of innovative BMPs (vegetative cover and hydroperiod) against traditional practices for sinkholes, and restore and create wetland functions

Interagency partners: Environmental Protection Agency; Natural Resource Conservation Service; Tennessee Department of Wildlife Resources; Tennessee Department of Environment and Conservation

Local partners: Logan County Rural Water Development District; South Logan County Water District; Cumberland River Compact; Red River Watershed Association;

University Center of Excellence for Field Biology; Agricultural community; landowners in area; local educators